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Harry Hastings-Surface Exercise

Instructor's Copy

Behavioral Research Aspects of Safety and
Health Group (BRASH)
Institute for Mining and Minerals Research (IMMR)
University of Kentucky, Lexington, Kentucky

November 1987

This latent image exercise was developed and field tested under U. S. Bureau of Mines research Contract No. HO348040. Information about the design and characteristics of the exercise and the field test results are available in the project technical reports filed with the Bureau of Mines Research Center in Pittsburgh, PA. This is one of more than 30 exercises designed for use in annual refresher training to teach and test critical skills for coping with mine emergency situations. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies or recommendations of the Interior Department's Bureau of Mines or the U. S. Government.

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Appendices

- Appendix A: Problem booklet (duplicate this copy for use in class)
- Appendix B: Answer sheet blank (print the latent image answers on this)
- Appendix C: Latent image answers (print these on the answer sheet)

Introduction

This document contains most of the materials needed to use the exercise. The main part of the document is the instructor's copy. It tells how to use the exercise, presents the objectives, the master answer sheet, the scoring key, and discussion notes to be used following the exercise. The next section summarizes the results from field tests of the exercise, and reports the miners' evaluation of the activity. The last part of this document is three appendices. Appendix A is the exercise problem booklet. This booklet can be duplicated locally. The booklets are reusable. One is needed for every person in the classroom. Appendix B is the answer sheet and the trainee's questionnaire. Copies of this answer sheet must have the latent image (invisible) ink answers that appear in Appendix C printed on them[1]. Answer sheets are consumable. One is needed for each person or each small group of persons who work the exercise.

Exercise Summary

Read this section first. It determines if the exercise is appropriate for your classes. If you choose to use the exercise, examine the table of contents and review the remainder of this document.

Type: Latent Image

Length: Seven questions (20 minutes for administration plus 25 for discussion)

Skills:
First aid
Conducting a primary and secondary survey
Treating a crushed chest injury and shock
Figuring out how to get help

Location: Surface

Problem: You are at a surface mine. You see Harry placing crib blocks between the frame and the bed of a large gob truck. The operator is in the truck cab. Suddenly the bed drops down, pinning Harry. If it were not for the blocks, Harry would have been cut in two. The operator quickly raises the bed. Harry falls to the ground near the rear wheels. The radio in the gob truck is broken. It is 20 minutes by pickup truck to the nearest help. You and the gob truck operator must figure out what to do for Harry or he may die.

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[1] You can do this yourself if you have the proper equipment, or you may wish to purchase copies of preprinted latent image answer sheets from the University of Kentucky, IMMR, 234 Mining and Minerals Resources Building, Lexington, KY 40506-0205, (606) 257-8636, or the National Mine Health and Safety Academy, P.O. Box 1166, Beckley, WV 25802-1166, (304) 255-0451.

HOW TO USE THIS EXERCISE

1. Look at the performance objectives. Decide if the exercise is relevant for your annual refresher class.
2. Work through the exercise with the special pen and score your responses.
3. Read the master answer sheet for the exercise. Look at all the answers.
4. Read the "Instructor's Discussion Notes" for the exercise.
5. Become thoroughly familiar with the problem so that you can present it to your class without reading it. Put the maps or illustrations on an overhead projector so you can use these to help explain the problem.
6. When you present the exercise to the class:

   - Explain that the answers from class members will be used to improve the exercise in the future.
   - Give each person an exercise booklet, an answer sheet and a pen.
   - Demonstrate how to select and mark answers using the special pen.
   - Go over the instructions for doing the exercise with the whole group.
   - Explain the problem making sure everyone understands the problem situation.
   - Have the class members work the exercise.
   - When the class members finish, have them figure up their score using the instructions at the end of the exercise.
   - When everyone has finished, discuss the exercise. Let class members discuss the merits of each answer. Add your own ideas. Then have each person fill out the Trainee's Questionnaire attached to the answer sheet.
   - After class look over the completed trainee's questionnaires and the answer sheets. This information may provide ideas for improving the exercise for future classes. Write out your ideas for improving the exercise and send them to the following address.

IMMR/BRASH
201 Porter Building, University of Kentucky
Lexington, Kentucky, 40506-0205 ph. (606) 257-3796

Performance Objectives for Harry Hastings-Surface Exercise

Objective number	Capability verb(s)	Description of required performance and conditions under which it is to occur
1 FA*	Recall Apply	The elements of the primary and secondary surveys given a list of options for action
2 FA	Recall Apply	The rules that victims with suspected spinal injury should not be encouraged to sit or stand and must be immobilized before being moved (unless an emergency situation requires movement to save life)
3 FA	Recall Select	Critical methods of immobilizing and moving a victim with a possible spinal injury, given a list of options
4 FA	Evaluate	A hypothetical patient for the presence of spinal fracture, crushed chest, and shock given a list of the victim's signs and symptoms
5 FA	Choose Judge	From among alternative actions, effective means of evaluating and treating an equipment injury victim given a written accident scenario

*Skill and knowledge domain abbreviation:
FA = first aid

Master Answer Sheet for Harry Hastings-Surface Exercise

Use this answer sheet to mark your selections. Rub the special pen gently and smoothly between the brackets. Don't scrub the pen or the message may blur. Be sure to color in the entire message once you have made a selection. Otherwise you may not get the information you need.

Question A (Choose only ONE unless directed to "Try again!")

1. [Harry may need immediate help. Try again!]
2. [Correct! This will tell you if Harry needs immediate help. Do next question.]
   [ ]
3. [This could cause further injury. Try again!]
4. [There are only two of you. You both may be needed to care for Harry. Try]
   [again!]

Question B (Select as MANY as you think are correct.)

5. [This could cause further injury.]
6. [Correct! You see his belly move and you can feel air move at his mouth.]
7. [Correct! No bleeding is seen.]
8. [Correct! Harry is moaning and swearing quietly.]
9. [Correct! A rapid pulse is present.]

Question C (Select as MANY as you think are correct.)

10. [Correct!]
11. [Correct! It is important to begin the mine emergency procedures.]
12. [This could cause further injury.]
13. [This could cause further injury.]
14. [This could cause further injury.]

Question D (Select as MANY as you think are correct.)

15. [Correct! He says "OK", but there is no movement.]

16. [Correct! He says he feels numb.]

17. [Correct! Pulse 120 and weak.]

18. [Correct! He appears pale.]

19. [No! This could cause further injury.]

20. [Correct! Stomach area feels normal.]

21. [Correct! His lower neck spine feels deformed.]

22. [Correct! No abnormalities are seen.]

23. [Correct! Part of his left chest draws in when he inhales and moves easily when you apply gentle pressure.]

Question E (Select as MANY as you think are correct.)

24. [Correct! This is done.]

25. [Correct! This is done.]

26. [This could cause further injuries.]

27. [Correct! This is done.]

28. [This could cause further injuries.]

Question F (Select as MANY as you think are correct.)

29. [Correct! Harry is in shock. The oxygen will help him breath.]

30. [Correct! Harry may have spinal injuries. Moving him could cause further injury.]

31. [Harry is in shock. Do not give him anything to eat or drink.]

32. [A pick up is not the best vehicle for moving accident victims. The bouncing truck could cause further injuries.]

Question F (continued)

33. [Correct! Harry is likely to have breathing problems. Maintain an open airway.]
[Check his breathing continuously.]

34. [Harry is in shock and may have spinal injuries. Getting him up and walking]
[is not proper treatment for shock and could cause additional serious injuries.]

Question G (Select as MANY as you think are correct.)

35. [Correct! This is done.]

36. [Correct! This is done.]

37. [It is almost impossible to lift a victim lying on his side and keep the head and]
[neck immobilized in a straight line. This could cause further injury.]

38. [Correct! This is done.]

39. [His head and neck should be immobilized first to prevent spinal injury.]

Finding your score

Number of "Correct" answers you colored in = (1) _____

15 minus number of incorrect answers you colored in = (2) _____

Add blanks one and two to get your total score = (3) _____

Highest possible score = 39

Lowest possible score = 0

TRAINEE'S QUESTIONNAIRE

1) name of exercise _____

2) your age _____ 3) your sex _____ M _____ F 4) years experience as a coal miner _____

5) your job title _____

Check all the areas in which you have special training, certification, and/or that you routinely perform.

		Special Training	Certification	Routinely Perform
6)	Mine Foreman	_____	_____	_____
7)	Mine Safety Committee	_____	_____	_____
8)	Mine rescue	_____	_____	_____
9)	CPR	_____	_____	_____
10)	Advanced first aid	_____	_____	_____
11)	EMT	_____	_____	_____
12)	Advanced life support	_____	_____	_____
13)	Other (describe) _____	_____	_____	_____

Think about the exercise you just finished. Circle the number which tells how much you agree or disagree with the following statements.

		Definitely Yes			Definitely No
14)	This problem could happen in real life.	4	3	2	1
15)	This exercise will help me remember something important if I am ever in a similar situation.	4	3	2	1
16)	I learned something new from the exercise.	4	3	2	1
17)	The exercise took too long to complete.	4	3	2	1
18)	I liked working the exercise.	4	3	2	1
19)	The instructor's directions were clear.	4	3	2	1
20)	The written directions in the exercise were easy to understand.	4	3	2	1
21)	The diagrams, charts, and pictures were easy to understand.	4	3	2	1
22)	The scoring procedures were easy to understand.	4	3	2	1
23)	The exercise was easy to read.	4	3	2	1

If you have anything more to say about the exercise, please write on the back of this page. Thank you.

Instructor's Discussion Notes for Harry Hastings-Surface Exercise

Use the information presented here and on the master answer sheet, your own ideas and experience, and that of the miners in your class to discuss the exercise after it is completed. Group discussion can strengthen knowledge and skills, correct errors, and relate the exercise content to the experiences of the miners. After they have worked the exercise, miners enjoy discussing the problem. They also frequently think of better ways to respond to a problem than those listed among the answers. The purpose of the exercise is to help miners think about and remember basic knowledge and skills they may someday need to deal with a mine emergency. The discussion following the exercise can contribute to this goal and tailor the exercise content to the needs of the group you are training.

It is helpful to show overhead transparencies of the answers on the master answer sheet during the discussion, while the miners look at their problem booklets. This allows you to lead the group through the exercise and to discuss all the answers to each question. Most of the information about why particular answers are correct or incorrect is given on the master answer sheet.

The following notes provide additional information for you to discuss with your class. Read through and think about the notes before the class. Don't read the notes to the class members. This would be boring and ineffective. Rather, incorporate the ideas you find here with your own ideas and make these points at the appropriate place in the discussion of the exercise.

Question A - The correct answer is 2. Assuming the accident scene is safe, first aid intervention begins with an examination of the victim. This is done to prevent further injuries and prioritize treatments. Since this particular accident suggests the possibility of a spinal injury, the victim should not be unnecessarily moved.

Question B - The correct answers are 6, 7, 8, and 9. The examination begins with the "primary survey." The skin and muscle at the top of the shoulder (trapezius muscle) is pinched and a phrase like "Are you OK?" is shouted as a check for consciousness. At this point the first-aider looks, listens and feels for breathing, and checks for the presence of a carotid pulse. If the victim were not breathing an airway would be obtained using a jaw thrust maneuver, because of a possible neck spine injury in this case. (See Figure 3 on page 22.) If the victim does not require immediate rescue breathing or CPR, he or she should be checked for significant bleeding before proceeding.

Question C - The correct answers are 10 and 11. If the victim does not require immediate first aid during the primary survey, a secondary survey should be initiated. Since the nature of this particular accident suggests a severe injury, steps should be taken to secure EMT help at the earliest opportunity.

Question D - The correct answers are 15, 16, 17, 18, 20, 21, 22, and 23. When a neck

spine injury is possible, the secondary survey should begin with the question "Where does it hurt?" since, according to neurosurgeon, Martin H. Weiss, (Emergency Medicine, April 15, 1984) the conscious victim will always exhibit pain at the point of injury even though he or she may have loss of sensation below that point. If the victim is disoriented, signs of pain will be elicited when the rescuer gently feels the spine at the injury site. If pain is present, or if the victim is unconscious as the result of trauma, the head and neck must be immobilized before continuing with the examination. Once the head and neck are immobilized and pulse and breathing rates are determined, the survey proceeds in a head to toe manner.

Question E - The correct answers are 24, 25, and 27. The secondary survey has revealed signs of a neck spine injury, crushed chest, and shock which are treated in turn by immobilizing the head, neck, and body, taping dressing over the injured chest, and covering the victim with a blanket. Throughout these procedures care should be taken so that the victim is not moved unnecessarily. As many as 25% of the neck spine injuries that result in permanent disability are caused by improper handling on the part of care givers (Emergency Medicine, April 15, 1984).

Question F - The correct answers are 29, 30, and 33. While waiting for help to arrive the victim's airway, breathing and pulse should be checked periodically because his condition may deteriorate. If you are trained to do so, oxygen should be started because the victim's diaphragm may not function well when there is a spinal injury. It is also important to give oxygen to prevent further damage to the cord from lack of oxygen. Until EMTs arrive, the victim should only be moved in order to perform CPR, if this becomes necessary because breathing and pulse cease.

Question G - The correct answers are 35, 36, and 38. The first step in transporting a victim with a possible neck spine injury is to apply a rigid cervical collar. This requires an EMT to apply gentle traction while a second person applies the collar segments. A padded spine board is then placed beside the victim and the victim is log rolled onto the board using a four person technique, with the most experienced person holding the victim's head. The head and neck must be kept in alignment with the victim's body at all times. (See Figure 4 and 5.) Sandbags are then placed on each side of the head and a long strip of adhesive tape applied between the sandbags and across the victim's forehead. Finally the victim is strapped to the board, working from the head and chest down to the legs.

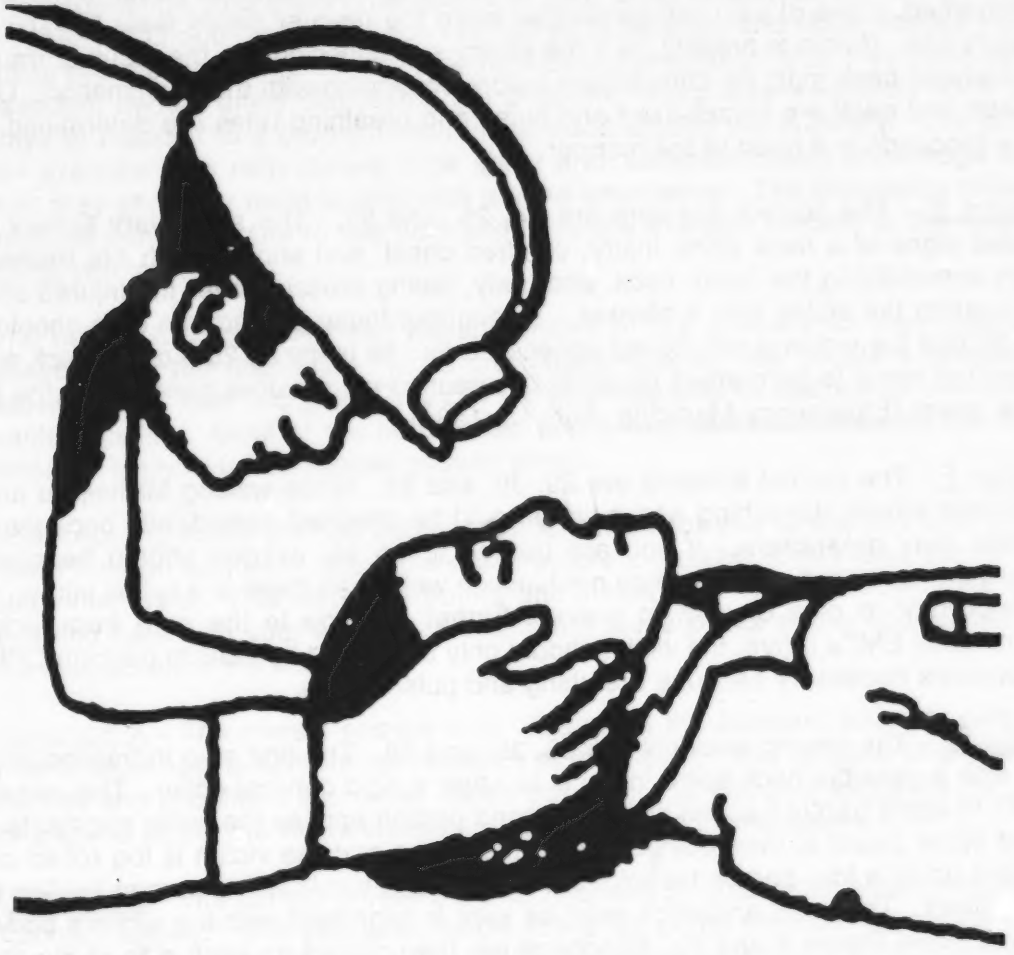

Figure 3: Jaw thrust manuver

Figure 4: Log rolling a side lying victim - first position

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Scoring Key for Harry Hastings-Surface Exercise

Question A

1. ___W___
2. ___R___
3. ___W___
4. ___W___

Question B

5. ___W___
6. ___R___
7. ___R___
8. ___R___
9. ___R___

Question C

10. ___R___
11. ___R___
12. ___W___
13. ___W___
14. ___W___

Question D

15. ___R___
16. ___R___
17. ___R___
18. ___R___
19. ___W___
20. ___R___
21. ___R___
22. ___R___
23. ___R___

Question E

24. ___R___
25. ___R___
26. ___W___
27. ___R___
28. ___W___

Question F

29. ___R___
30. ___R___
31. ___W___
32. ___W___
33. ___R___
34. ___W___

Question G

35. ___R___
36. ___R___
37. ___W___
38. ___R___
39. ___W___

Summary of Field Test Results

The Harry Hastings-Surface Exercise (HHS) underwent 3 rounds of field testing, including authentication and field tests one, and two. The authentication consisted of a small initial field test that produced too little data for meaningful statistical summaries. However, the many comments, criticism, and suggestions received were used to revise and improve the exercise before the first formal field test. The formal field tests involved carefully controlled administration of the revised exercise to groups of miners at multiple sites. Each field test resulted in data used to revise and improve the exercise prior to the next field test of the new version. The first formal field test was done on too small a sample for meaningful statistical analysis to be done. Therefore, no data are presented for the HHS1 version of this exercise. This data was, however, used to revise the exercise. The HHS2 version was developed based on information gained in the authentication and in the field testing of HHS1. Tables that summarize the results of the field tests for HHS2 are attached. The version of the exercise included in this document includes all of the cumulative revisions made as a result of the three rounds of field tests.

HHS2 was field tested with 66 miners, in 4 classes, at 2 sites. One set of tables is attached for the field test results of HHS2. The set of tables is divided into two parts. The first part describes the people who participated in the field test and their evaluation of the exercise. The second part describes the measurement properties of the exercise.

Sample characteristics and miners' evaluations

Tables 1 through 3 describe demographic characteristics of the sample. Table 4 indicates the number of persons in the sample who reported either some training, special certification, and/or routine performance of the eight areas listed as rows in the table. Inspection of these tables quickly reveals the numbers and types of persons involved in the field test of the exercise.

Table 5 reports the miners' judgment of the exercise quality and worth. Each person was asked to rate the value of the exercise on each of ten qualities. By checking a number on a scale, miners indicated to what extent the exercise displayed each quality. Inspection of the values in Table 5 reveals the percentage of miners who reported that the exercise 1) was realistic, 2) helped them to remember important things, 3) helped them learn something new, 4) was too long, 5) was enjoyable, 6) instructor's directions were clear, 7) written directions were clear, 8) illustrations and maps were clear, 9) scoring procedures were easy to understand, and 10) was easy to read.

Psychometric properties

The next set of tables describe the psychometric (mental performance measurement) properties of the exercise. Table 6 presents summary data for each of the exercise questions, including the minimum, maximum, median, and mean question scores

observed in the sample; the standard deviation and skewness of each question score; the squared correlation coefficient of each individual question score with the exercise total score; and the estimated reliability of the total exercise score if that particular question were dropped from the test. The last line in Table 6 reports the same information for the total exercise score. This is obtained by summing question scores across the whole exercise. Each question is weighted such that a perfect score on each question sums to 100 for the exercise total score. Inspection of the table quickly presents the basic performance data for the sample.

The weighting of each question score to produce a total score of 100 is designed to allow comparison of the difficulty of different versions of the same exercise, or different exercises, even though these often have different numbers of questions. The total score of 100 is also a common convention for reporting test scores.

Table 7 reports the number of answers (options) to questions that discriminated properly between persons with high scores on the test and those persons with low scores. Tests that have multiple choice answers to questions must include some incorrect and some correct answers. The person who takes the test must choose among correct and incorrect answers (distractors) to each question. Persons who get a high total score on the test know more about the test content than persons who get low scores. Therefore, when data are aggregated from the whole sample of persons who took the test, wrong answers (distractors) to each question on the test should be significantly negatively correlated with the overall test score, and correct answers to questions should be significantly positively correlated with the exercise total score. When correct answers and wrong answers (distractors) behave this way, the answer (whether correct or incorrect) is said to positively discriminate between persons who know much about the content and those who know little. However, when persons who get high scores on the total test tend to pick wrong answers (distractors) more frequently than persons who get low scores, the answer is said to reverse or negatively discriminate. The opposite case is also true. That is, when persons who get low scores on the total test score tend to pick a right answer to a question more frequently than persons who had high total test scores, that answer is also said to reverse or negatively discriminate. The discrimination values are used to identify and correct problems in the answers for questions. To be valid, the method requires an adequate sample of persons who exhibit a wide range of variability in their total test scores.

Table 7 reports the frequency with which answers to questions behaved in this desirable way. The table tells the percentage of answers to questions on the test that discriminated positively, negatively, or not at all among the ability levels represented in the field test sample.

Finally, the last table examines the degree to which miners in the field test sample exhibited mastery of the mine emergency judgment and decision making skills assessed by the HHS exercise. The metric used in this analysis is a scaled score ranging from 0 to 100. A 90 percent or higher mastery performance criterion by 95 percent of the sample is a reasonable expectation for technically trained personnel in critical skill performance. However, 90 percent mastery was acheived by only 25

percent of the sample. The reason for this lower than anticipated mastery level may be the relatively infrequent practice of the needed skills. This suggests that the content of the exercise has been appropriately targeted.

The number of miners reported in the tables varies. This is because not all miners answered all of the questions on the trainee's questionnaire. Also, demographic data received from the field test are individual's responses, while the psychometric data reflect small group performances. Instructors had the miners work the exercise in small groups. This is a good instructional procedure that miners enjoy. Therefore, Tables 1 through 5 report the actual or valid percent of persons who responded to specific items on the trainee's questionnaire. The remainder of the psychometric tables report data from the performance of each small group. The 66 miners worked in 25 different small groups.

Characteristics of the HHS Exercise

The mean score on HHS2 was 87.4 with a standard deviation of 7.58. Although the exercise is moderately easy for most miners, a number of miners make errors in critical skills that should be learned to perfection. Miners and trainers report the exercise is useful in teaching and reinforcing these critical skills.

Characteristics of the field test sample for HHS2 Exercise

(2 sites, 4 classes, n = 66)

Table 1: Age and experience of miners (years)

	n	mode	mean	s.d.
age	64	37	42 3	8.70
experience	27	0	11.2	9.75

Table 2: Gender distribution (%)

	n	frequency %
female	0	0
male	65	100

Table 3: Job classification

	n	frequency %
miner	4	6.3
maintenance/technical	10	15.9
supervisory/management	16	25.4
other	33	52.4

Table 4: Self-reported level of expertise (frequency %)

category	training	certification	performance
foreman	9.1	15.2	7.6
mine safety committee	1.5	0.0	3.0
mine rescue	1.5	0.0	1.5
CPR	7.6	3.0	1.5
advanced first aid	19.7	3.0	4.5
EMT	1.5	1.5	0.0
advanced life support	0.0	0.0	0.0
other	4.5	1.5	3.0

Table 5: Miners' rating of exercise validity, relevance, quality, and utility (frequency %)

content	definitely yes		definitely no		mean	s.d.
	4	3	2	1		
problem could happen	96.9	0.0	1.5	1.5	3.9	0.44
help remember important things	81.5	13.8	4.6	0.0	3.8	0.52
learned something new	55.4	30.8	4.6	9.2	3.3	0.94
exercise too long	11.1	3.2	7.9	77.8	1.5	1.00
liked working the exercise	79.7	12.5	4.7	3.1	3.7	0.71
instructor's directions clear	87.5	9.4	1.6	1.6	3.8	0.52
written exercise directions clear	73.0	22.2	3.2	1.6	3.7	0.62
graphics easy to understand	82.8	10.9	6.3	0.0	3.8	0.56
scoring easy to understand	71.4	14.3	9.5	4.8	3.5	0.86
exercise easy to read	90.8	7.7	1.5	0.0	3.9	0.36

Psychometric properties of HHS2 Exercise

(printout date 6/10/87, 2 sites, 4 classes, n = 66)
(25 groups)

Table 6: Question score and total score statistics

question	minimum score*	maximum score*	median	mean	s.d.	skewness	R^2_{QT}	alpha if question deleted
A	9.5	14.3	14.3	13.3	1.94	-1.60	0.13	0.50
B	5.7	14.3	11.4	12.1	2.64	-1.21	0.19	0.52
C	11.4	14.3	14.3	13.4	1.36	-0.82	0.19	0.60
D	3.2	14.3	12.7	11.1	3.40	-1.00	0.30	0.54
E	5.7	14.3	11.4	11.8	2.40	-0.71	0.40	0.36
F	9.5	14.3	14.3	13.6	1.30	-1.86	0.29	0.48
G	8.6	14.3	11.4	11.5	1.75	-0.02	0.21	0.46
Total	67.8	100.0	86.7	87.4	7.58	-0.71	(alpha = 0.54)	

*The values reported are the minimum and maximum scores observed, for this sample. The lowest possible score = 0 and the highest possible score = 14.3. When scores are summed across questions the highest possible score = 100 and the lowest possible score = 0.

Table 7: Proportion of answers discriminating positively, negatively, and not at all with exercise total score ($p<.10$)

positive	negative	no relationship
14/39 (35.9%)	0/39 (0.0%)	25/39 (64.1%)

Table 8: Number and percent of miners attaining various levels of proficiency (Data are for 24 small group performances)

exercise score	number at or above the score	percent at or above the score	cumulative percent
100	2	8.3	8.3
90	4	16.7	25.0
80	16	66.7	91.7
70	1	4.1	95.8
60	1	4.1	99.9
50	0	0.0	99.9

Appendix A: Problem Booklet

Duplicate this copy of the problem booklet for use in your classes. Each person in your class should have a problem booklet while they are working the exercise. The problem booklets are reusable. To save effort and money, ask the trainees to avoid marking in the booklets and collect all the booklets after the class.

You may obtain copies of the problem booklet from the University of Kentucky or the National Mine Health and Safety Academy. The addresses and telephone numbers for these two agencies are listed in the footnote on page three of this document.

Harry Hastings - Surface Exercise

Problem Booklet

Behavioral Research Aspects of Safety
and Health Group (BRASH)
Institute for Mining and Minerals Research (IMMR)
University of Kentucky, Lexington, Kentucky[1]

November 1987

[1] This latent image exercise was developed and field tested under U. S. Bureau of Mines research Contract No. HO348040 with the Bureau of Mines Research Center in Pittsburgh, PA. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies or recommendations of the Interior Department's Bureau of Mines or the U. S. Government.

Instructions

Read the problem situation described on the next page. Next, answer each of the seven questions. Do them one at a time. Don't jump ahead, but you may look back to earlier questions and answers. Some questions direct you to choose only one answer unless you are told to "Try again!" Other questions tell you to select as many answers as you think are correct. Follow the instructions for each question.

After you have selected a choice to a question, look up its number on the answer sheet. Select your answer to each question by rubbing the special pen between the brackets on the answer sheet. A hidden message will appear and tell you if you are right. When you finish you will learn how to score your performance.

Harry Hastings-Surface Exercise

Background

It is 2:05 p.m. on a dry, sunny day.
There is a 100-ton gob truck with the microphone missing from its two-way radio.
Three miners are within 5 minutes of the accident.
The scene is 20 minutes away from the mine office.
You are the most experienced first aider available.

Problem

Your buddy, Harry Hastings, is placing crib blocks between the frame and the raised bed of the gob truck. You hear Harry scream and look to see him crushed between the bed and the frame. Only the crib blocks prevent him from being cut in two. (See Figure 1.) The driver hears Harry and quickly raises the bed. Harry falls to the ground. You and the driver try to help. Harry is lying on his right side. (See Figure 2.)

Now turn to page 4 and begin.

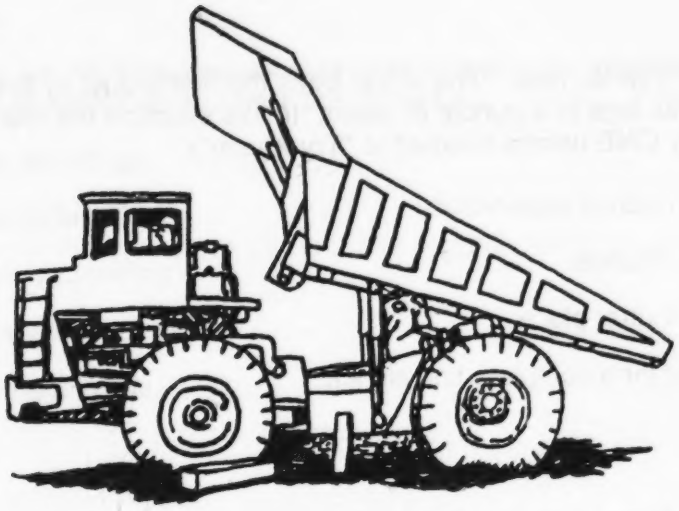

Figure 1: As the bed descends you hear Harry scream.

Figure 2: Harry falls to the ground, you and the driver try to help

Question A

You and the driver yell for help. The driver says the first aid kit in the truck is empty. Harry is lying with his legs in a puddle of water. In this situation the first thing you would do is: (Choose only ONE unless directed to "Try Again!")

1. Try to find the nearest supervisor.
2. Check Harry's injuries.
3. Drag Harry to a drier place.
4. Send the driver for a complete first aid kit.

Question B

Harry is lying on his side and you are checking him for injuries. How would you do this? (Select as MANY as you think are correct.)

5. Ask if he can sit up.
6. See if he is breathing.
7. See if he is bleeding.
8. See if he is conscious.
9. Feel his neck pulse.

WHEN YOU HAVE MADE YOUR SELECTION(S) DO THE NEXT QUESTION.

Question C

Three miners who heard your shouts for help come to assist. You have made your initial check of Harry's injuries. He is lying on his side and moaning softly. What should you do now? (Select as MANY as you think are correct.)

10. Continue checking Harry's injuries.
11. Send one of the miners to flag down the nearest truck with a working two-way radio.
12. Ask Harry to sit up if he can.
13. Tell your buddies to move Harry to a nearby pickup.
14. Roll Harry onto his back, prop his legs up about a foot, and cover him with your jacket.

WHEN YOU HAVE MADE YOUR SELECTION(S), DO THE NEXT QUESTION.

Question D

You continue to check Harry for injuries. How would you do this? (Select as MANY as you think are correct.)

15. Ask if he can wiggle his fingers and toes.
16. Ask if he is in pain.
17. Check his pulse rate.
18. Check his skin color.
19. Gently turn his head from side to side.
20. Gently feel his stomach area.
21. Gently feel his spine with your fingertips.
22. Look at his arms and legs.
23. Look at and apply gentle pressure to each side of his chest.

WHEN YOU HAVE MADE YOUR SELECTION(S), DO THE NEXT QUESTION.

Question E

As you finish your checks, one of your buddies arrives with a first aid kit, two blankets and a stretcher board. What would you do for Harry at this time? (Select as MANY as you think are correct.)

24. Cover him with a blanket.
25. Immobilize his head and neck with a blanket roll.
26. Turn him onto his back and elevate his legs.
27. Tape a bulky dressing over the injured area of his chest.
28. Prop up his head and shoulders with a blanket to help him breathe easier.

WHEN YOU HAVE MADE YOUR SELECTION(S), DO THE NEXT QUESTION.

Question F

One of your buddies returns and says it will take at least 20 minutes for the EMTs to reach the scene. Harry is having trouble breathing. What actions would you take at this time? (Select as MANY as you think are correct.)

29. Send one of the miners for oxygen.
30. Keep Harry lying on the ground, in the position you found him.
31. Give Harry plenty of warm liquids for stimulation and comfort.
32. Load Harry into a pickup truck and transport him to the mine office.
33. Make certain you monitor Harry's airway.
34. Try to get Harry up and moving to improve his circulation and to prevent shock.

WHEN YOU HAVE MADE YOUR SELECTION(S), DO THE NEXT QUESTION.

Question G

When the EMTs arrive at the mine, they prepare to load Harry into the ambulance for transportation to the hospital. Which of the following methods should they use? (Select as MANY as you think are correct.)

35. Apply a rigid collar around his neck before moving Harry.

36. Gently but firmly hold Harry's head with both hands to keep it in line with his neck and body while the other crew members log roll him onto the long spine board. Then immobilize him on his back.

37. Lift Harry onto the long spine board in the position he was found (lying on his side).

38. Secure the blanket roll splint with cravats at the forehead and chin.

39. When immobilizing Harry, begin with his feet and legs. Then work up to his abdomen, chest, neck, and head.

END OF PROBLEM

Scoring your performance

1. Count the total number of responses you colored in that were marked "correct". Write this number in the first blank on the answer sheet.

2. Count the total number of "incorrect" responses you colored in. Subtract this number from 15. Write the difference on the second blank on the answer sheet.

3. Add the numbers on the first and second blanks. This is your score.

The best possible score of 39 results from selecting all the correct answers and no wrong answers. The worst possible score of zero results from selecting all the wrong answers and no correct answers.

Appendix B: Answer Sheet Blanks

These are the answer sheet blanks. Copies of these blank answer sheets may be duplicated in the normal fashion. However, the answers that are found within the brackets must be printed on these blank answer sheets in latent image ink. These answers are found in Appendix C. If you have the capability to print latent image ink, make copies of the blank answer sheets. Then make a mimeograph master of the latent image answers that appear in Appendix C. Then print the invisible latent image ink on the blank answer sheets, being careful to make sure all pages print and that the appropriate answers line up with the appropriate blanks. The Master Answer Sheet in the first part of this document shows all the latent image answers in their proper place.

Most companies and trainers prefer to purchase preprinted answer sheets. You may obtain copies of preprinted latent image answer sheets from the University of Kentucky or the National Mine Health and Safety Academy. The addresses and telephone numbers for these two agencies are listed in the footnote on page 3 of this document. Instructions for printing your own latent image answer sheets are also available from these two agencies.

The exercise may be administered in small groups or individually. Used individually, you will need one answer sheet for each person in your class. If you use the exercise in small groups, you will need one answer sheet for each 3 to 5 persons in your class. The answer sheets are consumable. You will need a new set for each class.

Special latent image marking pens are also needed by each person who marks an answer sheet. These may be obtained from the University of Kentucky IMMR office or the National Mine Health and Safety Academy. The addresses and telephone numbers for these two agencies are listed in the footnote on page 3 of this document. You may also purchase latent image marking pens and latent image ink supplies from A. B. Dick Company, 5700 West Touhy Avenue, Chicago, Illinois 60648, (312) 763-1900. The A. B. Dick Chicago Office can put you in touch with the local supplier for your area.

Answer Sheet for Harry Hastings-Surface Exercise

Use this answer sheet to mark your selections. Rub the special pen gently and smoothly between the brackets. Don't scrub the pen or the message may blur. Be sure to color in the entire message once you have made a selection. Otherwise you may not get the information you need.

Question A (Choose only ONE unless directed to "Try again!")

1. [ ]
2. [ ]
   [ ]
3. [ ]
4. [ ]
   [ ]

Question B (Select as MANY as you think are correct.)

5. [ ]
6. [ ]
7. [ ]
8. [ ]
9. [ ]

Question C (Select as MANY as you think are correct.)

10. [ ]
11. [ ]
12. [ ]
13. [ ]
14. [ ]

Question D (Select as MANY as you think are correct.)

15. [ ]
16. [ ]
17. [ ]
18. [ ]
19. [ ]
20. [ ]
21. [ ]
22. [ ]
23. [ ]
    [ ]

Question E (Select as MANY as you think are correct.)

24. [ ]
25. [ ]
26. [ ]
27. [ ]
28. [ ]

Question F (Select as MANY as you think are correct.)

29. [ ]
30. [ ]
    [ ]
31. [ ]
32. [ ]
    [ ]

Question F (continued)

33. [ ]
    [ ]

34. [ ]
    [ ]

Question G (Select as MANY as you think are correct.)

35. [ ]

36. [ ]

37. [ ]
    [ ]

38. [ ]

39. [ ]

Finding your score

Number of "Correct" answers you colored in = (1) _____

15 minus number of incorrect answers you colored in = (2) _____

Add blanks one and two to get your total score = (3) _____

Highest possible score = 39

Lowest possible score = 0

TRAINEE'S QUESTIONNAIRE

1) name of exercise _____

2) your age _____ 3) your sex _____ M _____ F 4) years experience as a coal miner _____

5) your job title _____

Check all the areas in which you have special training, certification, and/or that you routinely perform.

		Special Training	Certification	Routinely Perform
6)	Mine Foreman	_____	_____	_____
7)	Mine Safety Committee	_____	_____	_____
8)	Mine rescue	_____	_____	_____
9)	CPR	_____	_____	_____
10)	Advanced first aid	_____	_____	_____
11)	EMT	_____	_____	_____
12)	Advanced life support	_____	_____	_____
13)	Other (describe) _____	_____	_____	_____

Think about the exercise you just finished. Circle the number which tells how much you agree or disagree with the following statements.

		Definitely Yes			Definitely No
14)	This problem could happen in real life.	4	3	2	1
15)	This exercise will help me remember something important if I am ever in a similar situation.	4	3	2	1
16)	I learned something new from the exercise.	4	3	2	1
17)	The exercise took too long to complete.	4	3	2	1
18)	I liked working the exercise.	4	3	2	1
19)	The instructor's directions were clear.	4	3	2	1
20)	The written directions in the exercise were easy to understand.	4	3	2	1
21)	The diagrams, charts, and pictures were easy to understand.	4	3	2	1
22)	The scoring procedures were easy to understand.	4	3	2	1
23)	The exercise was easy to read.	4	3	2	1

If you have anything more to say about the exercise, please write on the back of this page. Thank you.

Appendix C: Latent Image Answers

These pages contain the latent image answers that must be printed in the blanks of the answer sheet in Appendix B. These answers are spaced and sequenced correctly so that they exactly match up with the appropriate blanks on the answer sheet blank.

Once the latent image ink answers have been printed on the answer sheet blanks, the special developing pen reveals the formerly invisible (latent image) printed message.

You may purchase preprinted answer sheets or you may prepare your own copies. To learn more about this option, and to determine how many answer sheets and special pens you will need, see the introductory section for Appendix B.

Harry may need immediate help. Try again!

Correct! This will tell you if Harry needs immediate help. Do next question.

This could cause further injury. Try again!

There are only two of you. You both may be needed to care for Harry. Try again!

This could cause further injury.

Correct! You see his belly move and you can feel air move at his mouth.

Correct! No bleeding is seen.

Correct! Harry is moaning and swearing quietly.

Correct! A rapid pulse is present.

Correct!

Correct! It is important to begin the mine emergency procedures.

This could cause further injury.

This could cause further injury.

This could cause further injury.

Correct! He says "OK", but there is no movement.

Correct! He says he feels numb.

Correct! Pulse 120 and weak.

Correct! He appears pale.

No! This could cause further injury.

Correct! Stomach area feels normal.

Correct! His lower neck spine feels deformed.

Correct! No abnormalities are seen.

Correct! Part of his left chest draws in when he inhales and moves easily when you apply gentle pressure.

Correct! This is done.

Correct! This is done.

This could cause further injuries.

Correct! This is done.

This could cause further injuries.

Correct! Harry is in shock. The oxygen will help him breath.

Correct! Harry may have spinal injuries. Moving him could cause further injury.

Harry is in shock. Do not give him anything to eat or drink.

A pick up is not the best vehicle for moving accident victims. The bouncing truck could cause further injuries.

Correct! Harry is likely to have breathing problems. Maintain an open airway. Check his breathing continuously.

Harry is in shock and may have spinal injuries. Getting him up and walking is not proper treatment for shock and could cause additional serious injuries.

Correct! This is done.

Correct! This is done.

It is almost impossible to lift a victim lying on his side and keep the head and neck immobilized in a straight line. This could cause further injury.

Correct! This is done.

His head and neck should be immobilized first to prevent spinal injury.